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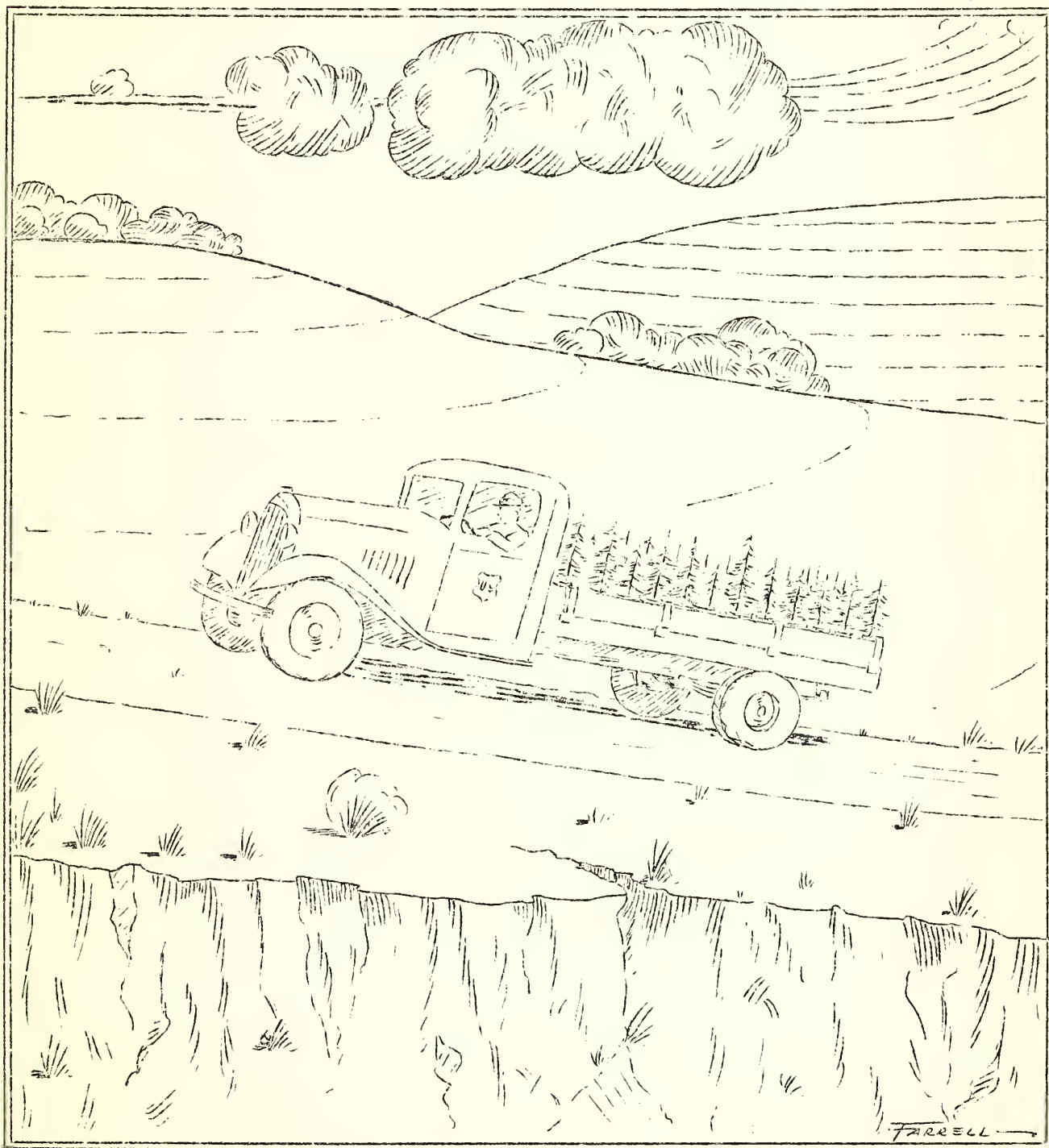
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# • CALIFORNIA EROSION DIGEST

VOLUME 1-NO 6.

MARCH 1935



UNITED STATES SOIL EROSION SERVICE

••• DEPARTMENT OF THE INTERIOR •••

HARRY E. REDDICK - REGIONAL DIRECTOR SANTA PAULA, CAL.



U. S. DEPARTMENT OF THE INTERIOR - SOIL EROSION SERVICE  
Issued monthly by California Erosion Control Project

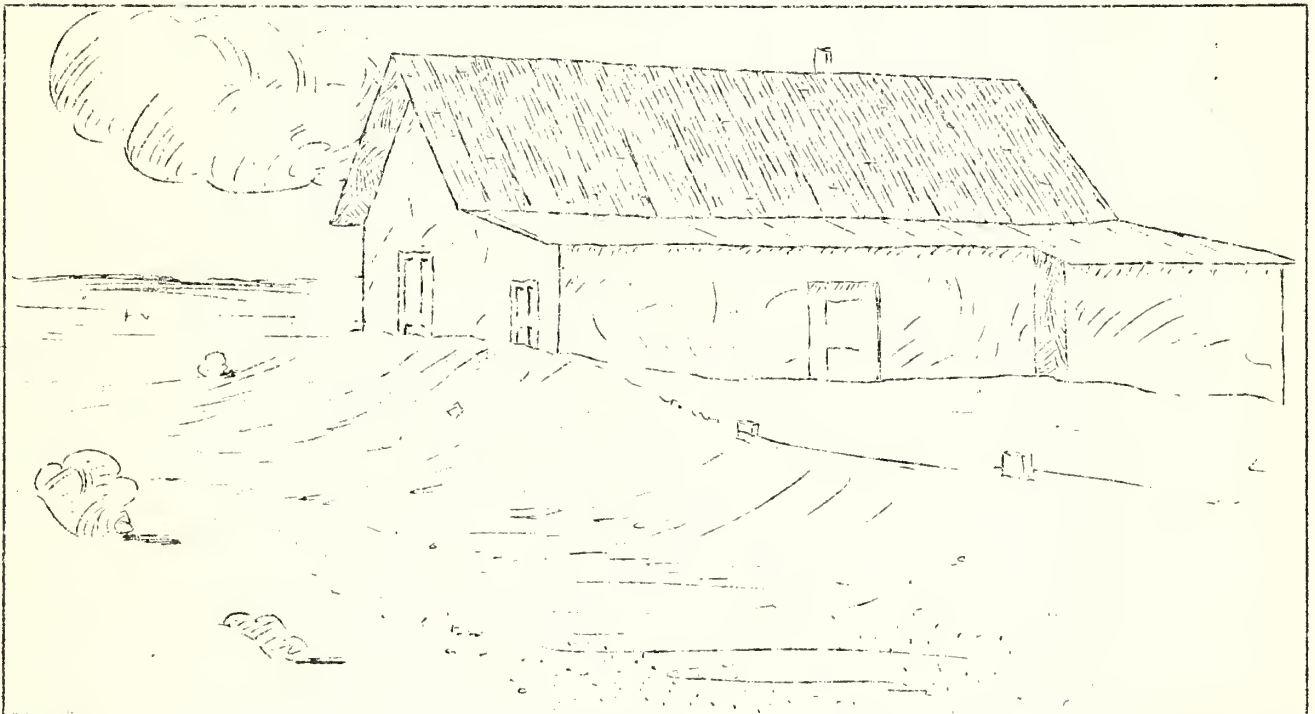
HARRY E. REDDICK - Regional Director

Santa Paula, California

Volume 1 - No 6

March 1935

## WIND EROSION DEVASTATES VAST AREA



Farm building half covered in dust swept from fields.

All of you have, undoubtedly, read of the gigantic dust storm that has been devastating the wheat and corn belt of the middle west. The important thing to realize in regard to this catastrophe is that it is due primarily to stripping the natural vegetative cover from the high, dry plains country. Until the World War this land was not cultivated but as a result of war-time prices for wheat it was put under the plow.

As long as the wet cycle continued nothing happened to call attention to the impending danger. However, last year the drought came and dust was carried clear to the Atlantic. This year the performance was repeated; - roaring winds swooped the soil from the high dry plains and carried it to the fertile farms farther east in Kansas, Missouri, Oklahoma, Nebraska, and parts of Iowa. Here it settled down in a dusty mantle, smothering the green shoots of wheat and disrupting life in town and country.

You say, "That's too bad; but what has all this got to do with California?" Just this. Although in this state wind erosion is secondary to that caused by rain falling on sloping clean cultivated lands, or on burned-over areas, it nevertheless brings to attention the tremendous implications of soil erosion control. Uncontrolled run-off may do more damage than that caused by the wind. The agricultural lands of the nation lose billions of tons of top soil from rain-wash every year.

Harry E. Reddick.

## TOUR OF LAS POSAS

### Soil Erosion Control Demonstration Area Santa Barbara County Agricultural Extension Service March 19, 1935.

Assemble Saticoy 1:15 P.M. Outline of U. S. Department of Interior  
Soil Erosion Service Program.

- Stop 1. Sheet erosion. Southeast of Del Norte School. Pipe line measures soil washed from a sloping bean field - 40 inches in 20 years.
2. Walnut & Central Ave. Western Boundary of Demonstration Area. Sheet erosion - gully erosion. Control methods.
3. Central Ave. Barranca control - Milligan Dam.
4. Central Ave. " " - "Fingering" - Spillways.
5. Berylwood Road. Sheet erosion at its worst, surface soil practically all gone. Note contour ditches enroute next stop north of road, marked by green lines of vegetation on banks of ditches.
6. Berylwood Road east of Aggen Road. Terracing to reduce runoff and sheet erosion.
7. Berylwood road Soil Erosion Service Warehouse. Hole-digging machine reduces runoff and sheet erosion. Note small watersheds for experimental determination of runoff and silt loss enroute to next stop.
8. Bradley Road. Camino Barranca. History. Sheet erosion and abandoned land. Soil was lost at the rate of 7.5 tons per acre on sloping land in young vegetation and at the rate of 58.7 tons per acre on clean cultivated land with a rainfall of 11.4 inches. Note strip crops on hills to north on leaving for next stop.
9. Circle eastern boundary of project. Notice stabilizing dams in barrancas. Erosion on steep hillsides. CCC Camp. Plots for measurement of runoff. Farming of steep slopes along eastern boundary of area - soil type frequently influences runoff to a greater extent than degree of slope, 75° slopes show more wash than 45° slopes on more absorptive soils. Note fingering of barranca to east of road.
10. Sand Canyon. Barranca encroaching on young citrus orchard.
11. CCC Camp #3. Vegetative control of sheet erosion, terraces, diversion ditches, gully control.
12. Donlon Road Dam. Barranca control by private capital.
13. Donlon Road. Barranca control - Missouri dam; reasons for failure.
14. Donlon Road to Los Angeles Ave. Contour orchard planting.
15. Los Angeles Ave. and Perkins Road. Fan built up on good soil of sand carried by water in gully above. Diversion ditch built around sand deposit to reduce load carried by water.

The Santa Barbara County residents making the tour were: Geo. T. Rutherford, Miguel A. Erro, J. L. Rutherford, J. L. Gracia, Martin D. Erro, Tolson Rutherford, W. L. Rutherford, T. H. Wood, of Goleta; Ben Overage and S. A. Anderson of Santa Barbara; Geo. Bundren of Saticoy; L. C. Johnson, Earl T. Jensen, H. P. Jensen, E. P. Smythe, of Solvang; and, R. E. McGregor of Buellton.

## THREE GRASSES SHOW PROMISE AS PROTECTIVE COVER

Richard E. Baker, Junior Agronomist.

Investigations underway by the agronomy department of the U. S. Soil Erosion Service in the demonstration area in the Las Posas indicate that three grasses - Domestic Rye Grass, Meadow Fescue, and Harding grass - may prove to be of value for improving pastures, for planting on land to be taken out of cultivation, for use in strips, and for planting around erosion control structures. These grasses are close growing and offer an efficient obstacle to soil washing.

### --Domestic Rye Grass--

Of the three Domestic Rye has shown the most rapid growth and the highest percentage of germination under field conditions. This grass is a short-lived perennial and produces an erect bunchy growth 18 to 24 inches high with numerous soft shiny leaves, seldom lasting more than two or three years, but unless grazed or cropped too close it produces an abundance of seed and will often maintain itself by reseeding.

Domestic Rye Grass is adapted to regions of mild winters, such as the cotton belt and the Pacific coast. Only in the latter region is it economically important. It grows rapidly at low temperature and recovers quickly after grazing or cutting, making an excellent winter and spring pasture.

### --Meadow Fescue--

This grass is a deep-rooted, long-lived perennial, producing an abundance of green leaves 18 to 24 inches high. Although the grass possesses no root stocks it makes a fairly good sod, and withstands pasturing very well. Old fields of Meadow Fescue are easily plowed and the grass is readily destroyed.

This grass should be cut just as it comes into bloom to produce the best quality hay. It is reported to be as palatable as timothy and stockmen consider it more fattening for cattle. The grass is, however, more satisfactory for pasture than for hay. In mixtures it usually maintains itself for about five years, but is at its best the second and third year.

### --Harding Grass--

This grass is a perennial and particularly valuable for the winter, spring, and early summer months, surviving even during heavy frosts and long droughts. The deep, extensive root system is especially valuable as a soil binder. The bulbous roots permit the plant to store up a certain amount of reserve food material, enabling the plant to quickly recover from extended drought periods.

Used for forage this grass re-seeds very readily but does not become a pest since the root system is fibrous. It differs in this respect from Bermuda or Johnson grass which spread by underground stems. The grass withstands heavy trampling. While young it is a very nutritious tender forage and should be a palatable hay for this region when mature.

①

*Fescue*



*Three grasses  
showing great promise  
as erosion resistant  
plants in Las Posas Area.*

②

*Rye Grass*



③

*Harding  
Grass*



All of these three grasses mentioned are perennials with fibrous root systems which firmly bind the soil particles together to a depth of three feet.

#### --Other Grasses--

Other grasses which have produced favorable growth are; Awmes Bromo Grass, Crested Wheat, and a native grass (*Holcus imperfecta*). All of these grasses are perennials with extensive fibrous root systems. However, if these grasses are to be planted as strip crops or on land taken out of cultivation, it would be desirable to precede them by a summer growing crop such as, Sudan Grass, Mat Beans, or Guar. These well established summer crops will protect the tender perennial grass seedlings from the severe sheet erosion and gullyng such as occurred during the heavy fall storms this past season.

Burnet is a deep-rooted, long-lived, herbaceous perennial growing to a height of 12 to 18 inches. It is commonly used in pasture mixtures along with grasses in England and Europe. At the present time it shows promise in this respect for this region. Burnet is commonly used on poor dry soils, high in lime. It will withstand heavy pasturing, and may be used in mixtures with any of the above perennial grasses.

Sudan acts as a perennial in this region, but only when not killed out by excessively low winter temperatures. This grass is frequently confused with Johnson grass because of its rather similar external appearance. However, the root systems are radically different. Johnson Grass spreads by underground stems, as is well known; whereas Sudan has a fibrous root system and is easily eradicated by cultivation.

#### ----- TREES IN EROSION CONTROL

Up to the present time a daily average of fifteen hundred to two thousand trees have been planted by the SES and the ECW camps in the Las Posas Area. Planting operations were well under way in November and over 200,000 trees have been planted, up to the last of February.

All species of trees planted were selected by the agronomy department particularly for extensive root systems able to hold the soil. Other factors which entered into the selection were: drought resistance, fire resistance, and ability to re-seed.

Species of introduced trees planted thus far are: Arizona Cyprus, several species of Eucalyptus, particularly the red, blue and grey gum, Arizona Ash, Aleppo Pine, two species of Elm, Black Locust, Coulter Pine. Native species are: California Holly, Lemonade Bush, Laurel-Sumac, Elderberry, Black Walnut, Water Wotie and Willow.

--By R. E. Baker.

## THE EVERLASTING COST OF SOIL EROSION

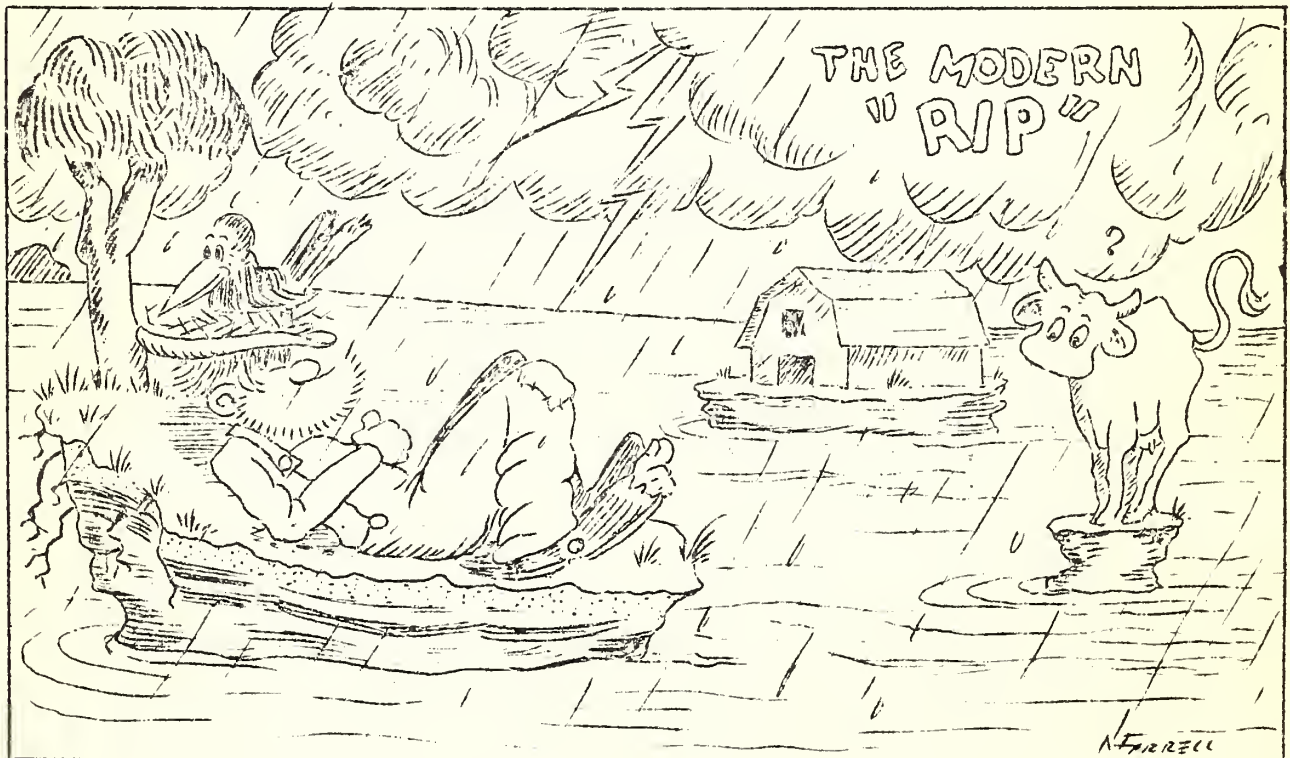
E. J. Carpenter, Chief Soils Expert.

(Ed. Note: E. J. Carpenter has been transferred to the Gila River Project at Safford, Arizona).

In counting the cost of uncontrolled or accelerated erosion, the tendency all too often is to consider only the loss occasioned by the removal of a few tons or inches of surface soil, or the loss and inconvenience caused by the cutting of a deep barranca through the bottom land.

Here in California, and especially in Southern California where moisture is such an important factor in crop production, the loss of a few inches of soil may mean a very appreciable continued loss in moisture as well. If soil is lost from hill land where the bedrock occurs at a depth of 36 inches, and we assume that 9 inches of soil is removed over a period of years, then we know that at least one-fourth of the water-holding capacity of this soil is gone, aside from the known loss in plant food.

Assuming that the soil weighs 85 pounds per cubic foot, which is about the average weight of a loam soil, and assuming that it has a normal field moisture capacity of 25 per cent, then the soil has lost a potential water-holding capacity equivalent to 347 tons per acre. Expressing this in inches of water, it means the loss of soil that has a potential capacity of holding slightly more than 3 inches of rainfall per acre. Since plants normally require between 200 and 900 pounds of water to produce one pound of dry matter, it can be assumed that under the climate of Southern California, about 600 pounds of water are required to produce a pound of dry matter. At this rate, enough water-holding capacity has been lost through the removal of 9 inches of soil by erosion to produce



1,157 pounds of dry matter per acre, or slightly more than one-half ton of hay per acre.

This, of course, does not take into consideration the fact that more than one-fourth of the readily available plant food in the soil has also been removed, for it is in this nine-inch layer that most of the organic materials are stored. The decomposition of this organic material not only furnishes plant feed in itself, but also through the formation of organic acids acts to liberate plant food from the mineral soil particles. Without bacteria, the liberation or formation of plant food in a soil proceeds at a very slow rate.

It is a well-known fact that a soil rich in plant food requires less moisture for the production of a given weight of dry matter than does one which is poor in plant food. Experiments with corn at the Nebraska Agricultural Experiment Station have shown that with an application of barnyard manure, the water required to produce a pound of dry matter was 350 pounds; on an infertile soil it was 550 pounds, and on a moderately fertile soil, 479 pounds of water were required to produce a pound of dry matter.

Numerous other experiments conducted throughout the world invariably tend to show similar results as regards the water requirements of fertile and infertile soils.

It may be seen, therefore, that the removal of the 9 inches of surface soil not only will reduce the potential water-holding capacity of the soil by 347 tons, but also, with the removal of a large part of the available plant food, more moisture is required to produce a pound of dry matter than was formerly the case. If the soil is several feet deep, we may assume, of course, that there has been no loss of water-holding capacity, as under the climate of Southern California several feet of soil is sufficient to retain all the annual rainfall. However, it has been found through recent studies of the Soils Department of the Las Vegas Erosion Control Station, that the rate of moisture penetration is much faster in uneroded land than in that which is eroded. In the two field studies, it was found that the uneroded area had slightly more moisture in the surface soil after the first fall rains than did the eroded area. However, a most striking difference was found at the depths of 12 to 24 inches, for in this zone the uneroded soil had 4.4 per cent more moisture per acre foot. A heavy volunteer cover crop occupied the uneroded soil, while the eroded one supported such a scant vegetative cover that fertilization would be necessary to establish a sufficiently heavy cover to stop further erosion. With the presentation of these facts, it may be seen that although in deep soils a sufficient water-holding capacity may still be present to retain all the rainfall, yet the rate of absorption is reduced and more moisture is required to produce a crop on infertile soil than on fertile soil, and further, that to establish cover crops on badly eroded soils, fertilization is an added expense to successful agricultural practices.

To restore through weathering of the underlying rock formation the nine-inch layer of soil lost through erosion would require a length of time that would vary with the character and hardness of the rock, and also with the climate. In the case of most sedimentary rocks, such as sandstones or shales, the time required would not be so great, but even from these rocks, it would probably require several hundred thousand years. In the case of the harder igneous rocks, this time would probably extend up into many hundreds of thousands of years.

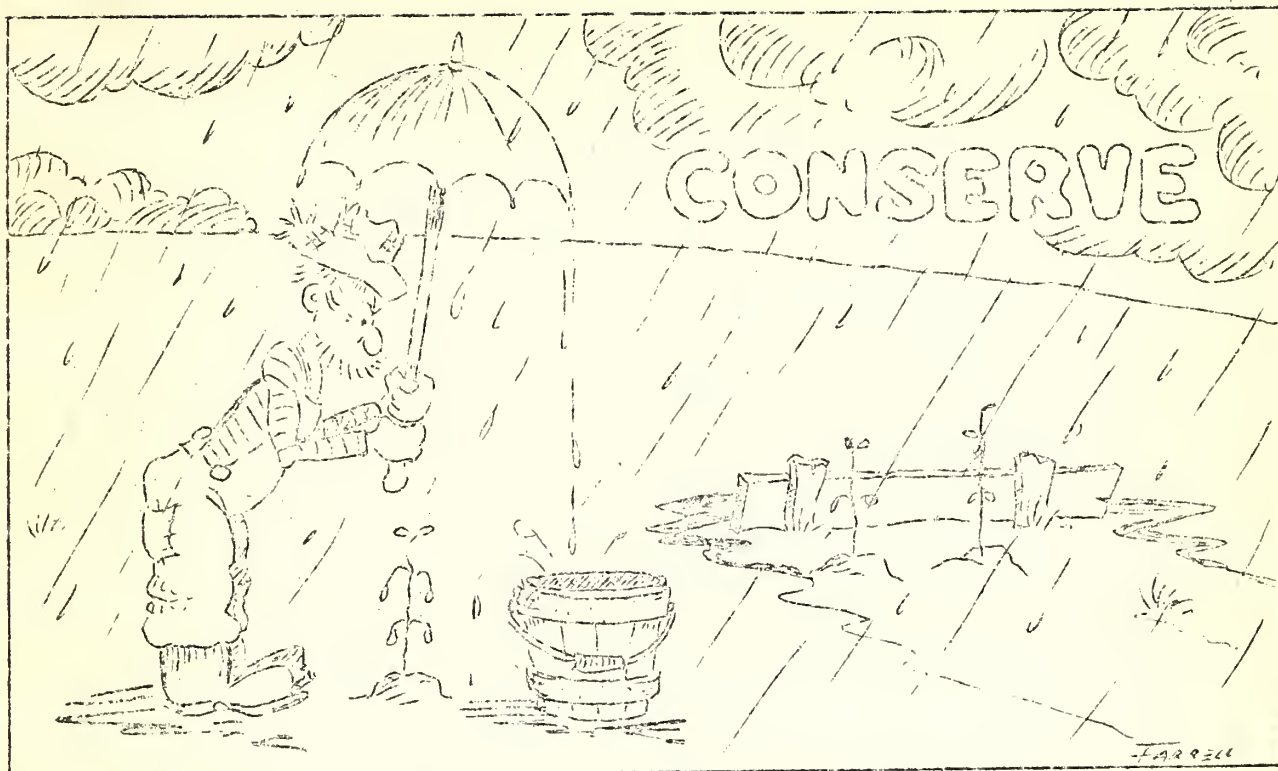
Aside from the loss in water-holding capacity, fertility, and actual soil loss, there are other losses that the farm operator continues to shoulder for many centuries. If we assume, and such is frequently the case, that the soil has developed a heavy textured clay subsoil through weathering, and that the friable, mellow surface nine inches has been removed by erosion, a greater hardship has been imposed on the farm operator than might at first be supposed. Most farmers will appreciate the difference in ease of operation of tillage implements in light textured sandy loam soils and heavy textured clay loam or clay soils. Bulletin No. 1348 of the United States Department of Agriculture shows that plowing a furrow six inches deep and a foot wide requires 200 to 400 pounds draft in a sandy loam soil, while in a heavy clay soil a furrow of similar depth and width requires 600 to 1,000 pounds draft. Expressed in horse-power hours, it requires  $4\frac{1}{2}$  to 9 horse-power hours per acre to plow the furrow in a sandy loam, and 15 to 22 horse-power hours per acre in a heavy clay soil. Depending on the size of tractor used, the operating cost per horse-power hour varies from slightly less than 5 cents to about 6 cents. Assuming the cost per horse-power hour to be  $5\frac{1}{2}$ ¢, it can be computed that it costs from 25¢ to about 50¢ per acre to plow a sandy loam soil, and from 72¢ to \$1.20 per acre to plow a heavy clay soil. This figure of cost covers, of course, only the cost of plowing; if the cost of all other tillage operations is figured in, it may well be that in many cases the difference in the cost of farming a sandy soil and a clay soil may be the difference between a profit and a loss to the farm operator. The control or lack of control of erosion in many well-weathered soils will determine whether or not the farm operator continues to till a sandy loam soil, or in its place perhaps a clay, if erosion is uncontrolled. All other conditions being equal, the yields of practically all crops will be greater from a loam soil than from a clay.

From the discussion herein presented, it should be apparent to anyone that erosion is something more than a removal of a few inches or tons of top soil. If uncontrolled, the cost of erosion through lowered crop yields, inconveniences, and increased costs of tillage are with the land-owner for many centuries. Since the welfare of the peoples of a nation and of the world depends primarily on its agriculture, no widely publicized catastrophe could be more great than the insidious processes of erosion.

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*	RADIO SCHEDULE	*
*		*
*	The following programs are on Western Farm and Home Hour,	*
*	western circuit of NBC. Our Regional Director will be	*
*	the speaker.	*
*		*
*	KFI - KPSD 12:15 P.M. Thursday, April 11. Title of talk	*
*	KFO - KGO "Making Running Water Talk". The speaker will	*
*	discuss the Arroyo Grande project.	*
*		*
*	KFI - KPSD 12:15 P.M. Thursday, April 25. The soil eros-	*
*	KFO - KGO ion control program for the Corralitos project	*
*	in Santa Cruz county will be explained.	*
*		*

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#### THE SUB-MARGINAL FARMER

(Editorial Note: We have all heard a lot about sub-marginal farmers but this article from the February issue of the Sandy Creek News, Project 19, Athens, Georgia, is the clearest exposition of the problem we have seen. Read it!)

"How would you manage, if you were a farmer and forced to provide for your family on an income of \$67.00 per year? Perhaps it would be impossible, but such is the condition facing a group of farmers living in the Sandy Creek watershed, not more than thirty minutes ride by automobile from the city of Athens.

\$67.00 was the average net farm income in 1933 of all the farmers living in a certain section of the Sandy Creek watershed as determined by a careful survey made by the Soil Erosion Service in cooperation with the Department of Rural Organization and Marketing of the College of Agriculture. This figure does not include that part of the family living supplied by the farm, but represents what was left, after farm expenses were deducted from the sale of farm products.

It is true that 1933 was not a very profitable year for farmers in general. The average farm income of all the farmers in the Sandy Creek watershed was \$180.00, which is small enough, but it is nearly three times as great as that of the group previously mentioned.

The group of farmers with an annual income of \$67.00 live in a section of the area where most of the farm land is on rather steep slopes. A large

portion of the top soil has been washed away and the meager crop yields were obtained only by the use of heavy applications of commercial fertilizer. The raw clay subsoil which is now exposed sheds the summer rains, leaving the crops to suffer from drought. This area is truly representative of thousands of acres of sub-marginal land in the Piedmont region.

This land was not always unproductive, as it is now. When the virgin timber was first cut from the hills the soil, protected for years by the tree roots and forest litter, was a deep sandy loam. It produced crops equally as abundant as the level land. But when the protective covering was removed, the process of erosion immediately set in and in a comparatively short time sheet erosion and gullying had practically destroyed the land. One of these farms, a six hundred acre tract, at one time was considered one of the best farms in this part of Georgia. For ten years it was rented to one man for an annual rental of \$1000, and the tenant made money. The present tenant gives seven bales of cotton rent, equivalent at present prices, to about \$450, and is forced to work in town to make enough to pay the rent. The farm was formerly operated with twenty mules and there was scarcely a foot of waste land on it. Now only eight mules are necessary to tend all the land that is suitable to farm. The remaining land has been "turned out" and is being rapidly destroyed by deep gullies. Nature is attempting to repair the damage with broom sedge and pine trees, but in many places erosion is so severe that not even a sassafras bush can gain a foot hold.

If these farmers were living in far away China, or in the darkest part of Africa, we might close our eyes to their condition. But they are our own neighbors and friends. Doubtless many of you were born in that section and possibly your parents or relatives still live there. If so, this problem of soil erosion is your personal problem.

But though we sympathize deeply with people who must live on such land, the biggest problem is, not what is to become of the unfortunate farmers left stranded on land that has washed away, but rather what is to become of the communities, the industries, the institutions, the modern civilization that depend on a profitable agriculture for maintenance. If you were a merchant and the average income of all your customers was \$67.00 per year, could you make money? Could any business or profession prosper if the farmers were reduced to such financial straits? The answers to these questions are obvious. Georgia is primarily an agricultural state. Her wealth comes largely from the farms. If we permit the farm land to be destroyed you may be sure that the loss will fall not only on the farmers themselves, but it will be felt equally by the butcher, the baker, the candle stick maker, and every other cog in our complicated social, business and professional system.

Doubtless some will think that the conditions described are extreme cases and not truly representative of the country as a whole. But your attention is called to a few figures obtained by careful surveys. In the Piedmont region 32,500,000 acres have eroded to a depth of from four inches to eighteen inches since the original timber growth was cut off. Of this amount 13,200,000 acres is so impoverished that profitable yields are no longer possible and 2,500,000 acres have completely destroyed by gullies. In the United States as a whole 125,000,000 acres have become impoverished--an area equivalent to the states of Georgia, North Carolina, South Carolina, Virginia, and Maryland.

The destruction of agricultural land has not retarded the development of America because as the older settled lands washed away and became impoverished, the center of population moved westward opening up new virgin soils. Small communities were abandoned and some large areas became poverty stricken, but the wealth continued to come from the newer soils and the country marched forward until today the United States leads the world. But what of the future? The westward trend which began in the days of Horace Greely has reached the Pacific. With the exception of some arid sections which may be opened up by means of irrigation projects, there is no more virgin land to be despoiled. The rising generation cannot move away from the eroded farms of their fathers but must salvage what they can from the wreckage and build a more permanent system of agriculture."

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#### Screeings From A Run-off.

The Santa Barbara County Planning Commission has prepared three diagrams showing recommended treatment of highway roadsides and, among other things recommended is the prevention of soil erosion on highway cuts. To quote: "Top soil should be saved for covering raw slopes when possible to promote plant growth.....Top soil should be spilled over the slope and partially held by check walls. The slope should be seeded or planted immediately with quick-growing material to prevent erosion. Permanent planting should be started as soon as possible thereafter."

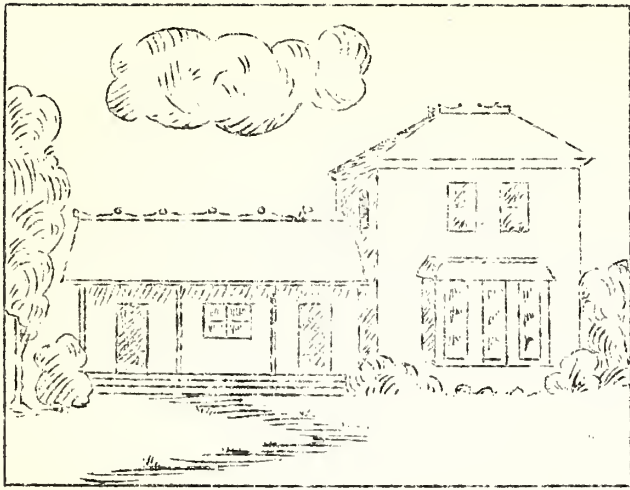
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#### Terraces Conserve Both Water And Soil.

"Results obtained on the relative losses of soil by erosion from terraced and unterraced lands demonstrates conclusively the great value of terraces as conservers of the soil. The longest record supporting the above statement has been obtained at the Soil Erosion Experiment Station at Guthrie, Oklahoma. A full three year record shows an average annual loss of 64.12 tons of soil per acre as compared with an average of 2.21 tons per acre from a terraced area. The terraced land lost only 3.4 per cent as much soil as the unterraced land. The soil and slope were practically the same on both areas, they were cropped essentially the same, and the average rainfall for the three-year period was about normal..... in addition to conserving the soil, terraces are effective in conserving more of the rainfall than unterraced land. For the stations in the Middle West the rainfall conserved by terraces ranges from about 3 per cent more for the Bethany, Missouri, Station to about 82 per cent more for the LaCrosse, Wisconsin, Station than for unterraced land during periods of one to three years. At the Pullman Station in Washington, nearly 200 per cent more of the rainfall was conserved on the terraced land than on the unterraced land." - Report of Proceedings of the Fifth Southwest Soil and Water Conservation Conference held at Manhattan, Kansas.

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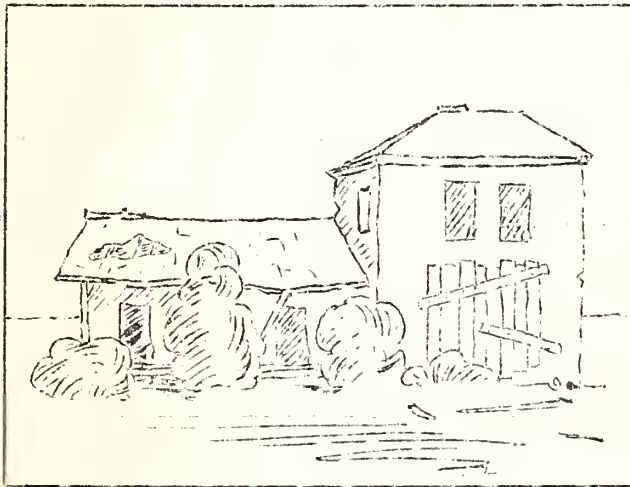
In browsing around the Santa Paula library one evening we saw an article in the California Cultivator for February Second that should be of interest to all "erosion conscious" citizens. Title: "Permanent-Furrow System for Controlling Run-off" -Page 64)....."The permanent-furrow system of cultivation for



-1881--

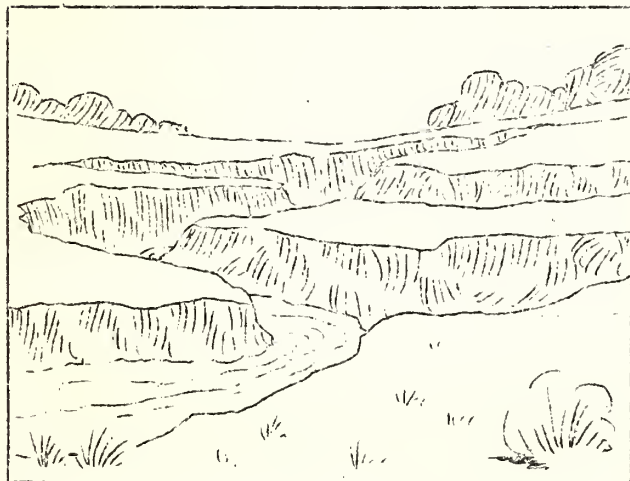
## DO WE WANT THIS TO HAPPEN ?

A farm in the middle west, on which this house stands, was obtained from the Government in 1853, the Teale family assuming possession in 1881. The house, then considered one of the most beautiful homes of the community, was sold by the family in 1900.



THE PRESENT-1935

There were no gullies on this farm when it was owned by them, according to Mr. Teale - in fact, there were hardly any in the community. Present condition of the farm was caused by force-farming since the World War. Today the house stands abandoned, the farm stripped by gullies which are still active.



These gullies show why the house has been abandoned.

irrigated orchards devised by C. A. Taylor of the Division of Irrigation, U. S. Bureau of Agricultural Engineering, has proved successful in controlling run-off this winter. Orchards at San Dimas and Pomona, using this system, showed very little run-off and no erosion even during the heavy rain in October. This system of cultivation is adapted to citrus orchards where straight-furrow irrigation is used. Seven shallow furrows between tree rows are customary and they are laid out with side slopes of three to one by the new type of furrowing implement. These relatively flat-sided slopes in the furrows are particularly advantageous in the control of erosion".....

During the summer weeds are controlled in the open furrows by the new implement with a minimum of soil disturbance and without breaking down the ridges between the furrows.

H. King, agriculturist for the Experiment Station of the Pineapple Producers Cooperative Association, Ltd., University of Hawaii, Honolulu, visited the demonstration area in the Las Posas on the eighteenth. He was conducted over the area by the Regional Director.

The afternoon of the nineteenth a group of bean growers and orchardists from the coast district of Santa Barbara County visited the Las Posas project. On the sixteenth the Southern California Association of Foresters and Fire wardens toured the area under the guidance of SMS representatives. Forty cars were in the caravan.

#### MOVIES OF BOULDER DAM SHOWN AT STAFF MEETING.

A meeting of the staff was held the evening of the eighteenth. R. S. Richards, chief draftsman, gave a very thorough talk on drafting rooms methods, with especial reference to problems dealing with soil erosion, such as the making of maps, determining acreages eroded.....Anson Averell explained the technical side of photography; demonstrated the use of various types of cameras and the type of work for which they are best adapted. Some of them have plenty of gadgets.

The Regional Advisory council of the U. S. Soil Erosion Service met in Santa Paula the fourteenth. Those present were: C. C. Teague, Professor Walter W. Feir, J. N. Thille, and Dr. George Clements.

"Eight new erosion control projects comprising a total area of more than 12,000,000 acres in eight states have been established within the past month." ...The Land Today and Tomorrow, February. Official Bulletin Soil Erosion Service.

That's all folks! ... Walter A. Lloyd.

## CONSERVATION COMMITTEE AIDS CORRALITOS PROJECT.

The Santa Cruz county conservation soil erosion committee, headed by Mr. Harold Nelson, of Santa Cruz, and consisting of Mr. Followay and Mr. H. H. Roads from the Valencia District, Mr. Day from Day Valley, Mr. H. C. Hemmitt from Pleasant Valley, Mr. Walter Bradley from Corralitos and Mr. E. A. Hitchings from Green Valley met with Mr. E. B. Cozzons, Assistant Regional Director of the Soil Erosion Service, on March 8th and made a splendid report to the County Conservation Association meeting on Monday March 11th. The committee was very anxious to cooperate in any way possible with the Soil Erosion Service in advancing the work in erosion control in the Corralitos area.

### SOILS OF THE CORRALITOS AREA.

By Dr. Logan S. Carter, Assistant Soils Expert

The soils of the Corralitos Area have been derived from a wide variety of rocks, including sandstone, shale, igneous and partially cemented conglomerate, with sandstone and shale predominating. (Ed. Note: Igneous rock are cooled and formed from molten mass. They may be thrust out as in volcanic activity or a lava flow. Conglomerate material includes a wide mixture of rocks). Soils derived from sandstone in this area are usually light in texture, low in organic matter, low in basic elements, but quite high in iron as evidenced by the extensive black and yellow coloration. The residual soils (Ed. Note: Soils formed in place by weathering of the parent material) derived from sandstone occupy the lower foothills and mountains of the central and western part of the area. Erosion has been very active on the steeper slopes of these soils, as evidenced by poorly developed soil profiles.

Residual Soils derived from shales are found in the eastern and north-eastern part of the area. These soils are usually heavy textured, relatively high in organic matter and quite fertile. Soils profiles are better developed and erosion is less active than on the sandstone formations, except on some of the excessively steep slopes.

A large acreage of soils are found in the west central part of the area that have been derived from coastal dune sand. These soils are light textured, exceptionally low in organic matter, extremely acid in reaction and usually in a low state of fertility, if under cultivation.

Valley filling or transported soils occupying the valley terraces are usually medium textured, if derived from sandstone and conglomerate rock sources, and heavy textured if derived from shales. On the more level to undulating topography, these soils exhibit a well developed profile, with considerable clay accumulation in the subsoil. Drainage and erosion has played an important part in soil profile development.

Soils of the alluvial fan and flood plains when derived from mixed rock sources with sandstones material predominating are usually light to medium textured, well supplied with organic matter, quite fertile and exhibit a young soil profile. Soils occupying a similar location but originating mainly from shale rocks are usually heavier textured, more fertile, contain larger quantities of organic matter, and are darker in color than similar soils from sandstones.